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RCP2/RCS2 Actuator
Rotary Type/Hollowed Rotary Type
First Step Guide Third Edition

Thank you for purchasing our product.
Make sure to read the Safety Guide and detailed Instruction Manual (CD/DVD) included with the product in addition to this First Step Guide to ensure correct use.
This Instruction Manual is original.

Warning : Operation of this equipment requires detailed installation and operation instructions which are provided on the CD/DVD Manual included in the box this device was packaged in. It should be retained with this device at all times.
A copy of the CD/DVD Manual can be requested by contacting your nearest IAI Sales Office listed at the back cover of the Instruction Manual or on the First Step Guide.

Product Check

This product is comprised of the following parts if it is of standard configuration.
If you find any fault in the contained model or any missing parts, contact us or our distributor.

1. Parts (The option is excluded.)

No.	Part Name	Model	Remarks
1	Actuator Main Body	Refer to “How to read the model plate”, “How to read the model.”	
Accessories			
2	Motor • Encoder Cable*1		
3	First Step Guide		
4	Instruction Manual (CD/DVD)		
5	Safety Guide		

*1 Enclosed motor cable and encoder cable differ depending on the model and the applied controller. Please refer to [Wiring] for the applicable cables.

2. How to read the model plate

Model → MODEL RCP2-RTBS-I-20P-30-330-P1-S-NM
Serial number → SERIAL No. 800061901 MADE IN JAPAN

3. How to read the model

3.1 RCP2 Type

RCP2-RTBS-I-20P-30-330-P1-S-NM

<Series>
<Type>
RTBS : Small Vertical Type 330-degree Rotation Specification
RTBSL : Small Vertical Type Multi-Rotation Specification
RTCS : Small Flat Type 330-degree Rotation Specification
RTCSL : Small Flat Type Multi-Rotation Specification
RTB : Medium Vertical Type 330-degree Rotation Specification
RTBL : Medium Vertical Type Multi-Rotation Specification
RTC : Medium Flat Type 330-degree Rotation Specification
RTCL : Medium Flat Type Multi-Rotation Specification
RTBB : Large Vertical Type 330-degree Rotation Specification
RTBBL : Large Vertical Type Multi-Rotation Specification
RTCB : Large Flat Type 330-degree Rotation Specification
RTCBL : Large Flat Type Multi-Rotation Specification
<Encoder Type>
I : Incremental
<Motor Type>
20P : Pulse Motor 20 □Size
28P : Pulse Motor 28 □Size
35P : Pulse Motor 35 □Size
<Gear Ratio>
20 : 1/20
30 : 1/30
45 : 1/45
<Rotation Angle>
330 : 330 Degrees (RTBS, RTB, RTBB, RTCS, RTC, RTCB)
360 : 360 Degrees (RTBSL, RTBL, RTBBL, RTCSL, RTCL, RTCBL)
<Applicable Controller>
P1 : PCON RPCON PSEL
P3 : PMEC PSEP
<Option>
NM : Reversed Home Specification
SA : Shaft Adapter
TA : Table Adapter
<Cable Length>
N : None
P : 1m
S : 3m
M : 5m
X□□ : Specified Length (Example: X07=7m)

[Refer to the Catalog or Instruction Manual (CD/DVD) for specification details.]

3.2 RCS2 Type

RCS2-RT6-I-60-18-300-T1-S-L

<Series>
<Type>
RT6 : Motor Straight Type
RT6R : Motor Reversing Type
RT7R : Motor Reversing Hollowed Shaft Type
RTC8L : Hollowed Small Standard Type
RTC8HL : Hollowed Small High Output Type
RTC10L : Hollowed Medium Type
RTC12L : Hollowed Large Type
<Encoder Type>
A : Absolute
I : Incremental
<Motor Type>
12 : Servo-Motor 12W
20 : Servo-Motor 20W
60 : Servo-Motor 60W
150 : Servo-Motor 150W
<Gear Ratio>
4 : 1/4
15 : 1/15
18 : 1/18
24 : 1/24
30 : 1/30
<Rotation Angle>
300 : 300 degrees
360 : 360 degrees
<Controller>
T1 : XSEL-J/K
T2 : SCON SSEL XSEL-P/Q
<Cable Length>
N : None
P : 1m
S : 3m
M : 5m
X□□ : Specified Length (Example: X07=7m)
R□□ : Robot Cable (Example: R05=5m)
<Option>
L : Limit Switch (Standard Equipment)
B : Brake
NM : Reversed Home Specification
CE : CE Marking

[Refer to the Catalog or Instruction Manual (CD/DVD) for specification details.]

Precautions in Handling

1. Handling of the Packed Product
Unless otherwise specified, the actuator is shipped with each axis packaged separately.
- Do not damage or drop. The package is not supplied with any special treatment that enables it to resist an impact caused by a drop or crash.
- If the shipping box is to be left standing, it should be in a horizontal position. Follow the instruction if there is any for the packaging condition.
- Do not step or sit on the package.
- Do not put any load that may cause a deformation or breakage of the package.

2 Handling of Robot without Package
- Do not carry the actuator by holding the cable, or do not move it by pulling the cable.
- When carrying the actuator, exercise caution not to bump it against nearby objects or structures.
- Do not give any excessive force to any of the sections in the actuator.

Installation Environment, Storage Environment

1. Installation Environment
An environment that satisfies the following conditions is required during installation.
- There should be no direct sunlight.
- Any radiant heat from a large heat source such as a heat treatment furnace should not be directed at the machine main body.
- The ambient temperature should be 0 to 40°C.
- The relative humidity should be 85% or less. There should not be dew condensation.
- There should be no corrosive gas or flammable gas.
- There should be no flammable dust or ignitable liquid in the surroundings.
- Oil mist or cutting liquid should not be directed at the machine.
- Chemical liquid should not be splashed on it.
- An impact or vibration should not be transmitted to it.
- There should be no strong electromagnetic waves, ultraviolet rays or radiation.
- The actuator should not be installed where it gets dipped in liquid.
- The working space required for maintenance or inspection should be secured.

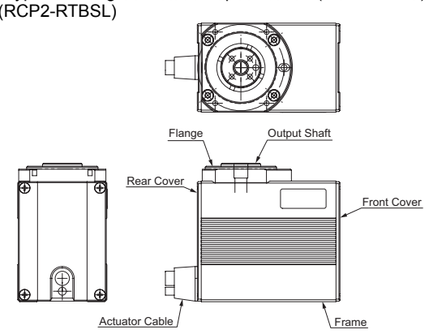
2. Storage and Preservation Environment
The storage and preservation environment should comply with the same standards as those for the installation environment. In particular, when the machine is to be stored and preserved for a long time, pay close attention to environmental conditions so that no dew condensation forms.
Unless specially specified, moisture absorbency protection is not included in the package when the machine is delivered. In the case that the machine is to be stored and preserved in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.
For storage and preservation temperature, the machine withstands temperatures up to 60°C for a short time, but in the case of the storage and preservation period of 1 month or more, control the temperature to 50°C or less.

Storage and preservation should be performed in the horizontal condition.

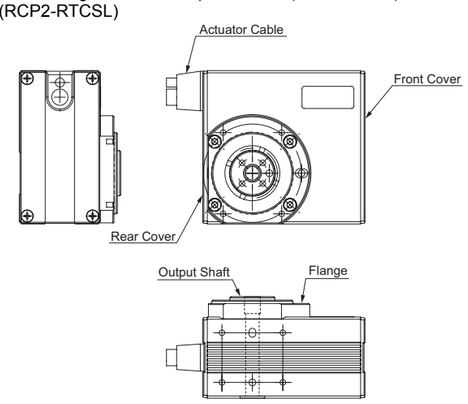
Names of the Parts

1. RCP2

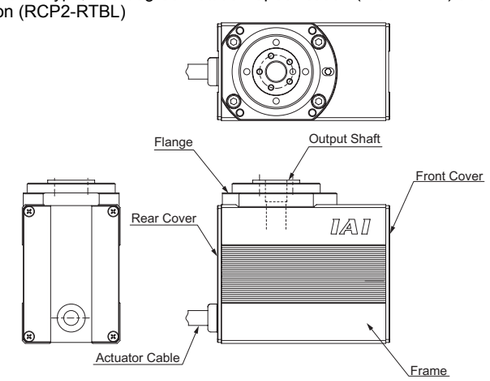
1.1 Small Vertical Type, 330-degree Rotation Specification (RCP2-RTBS) and Multi-Rotation Specification (RCP2-RTBSL)



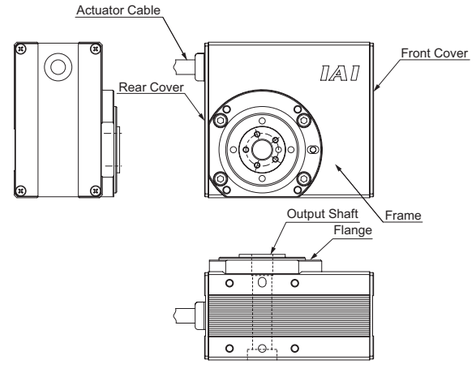
1.2 Small Flat Type, 330-degree Rotation Specification (RCP2-RTCS) and Multi-Rotation Specification (RCP2-RTCSL)



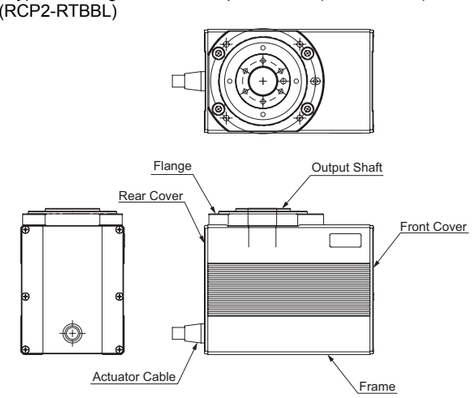
1.3 Medium Vertical Type, 330-degree Rotation Specification (RCP2-RTB) and Multi-Rotation Specification (RCP2-RTBL)



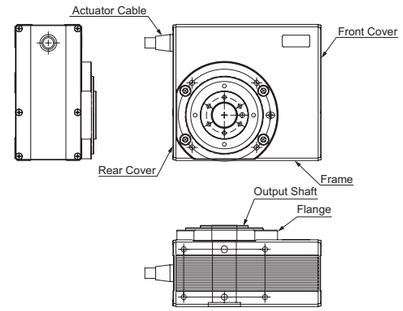
1.4 Medium Flat Type, 330-degree Rotation Specification (RCP2-RTC) and Multi-Rotation Specification (RCP2-RTCL)



1.5 Large Vertical Type, 330-degree Rotation Specification (RCP2-RTBB) and Multi-Rotation Specification (RCP2-RTBBL)



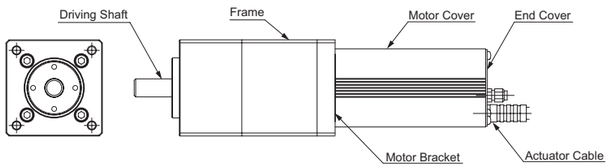
1.6 Large Flat Type, 330-degree Rotation Specification (RCP2-RTCB) and Multi-Rotation Specification (RCP2-RTCBL)



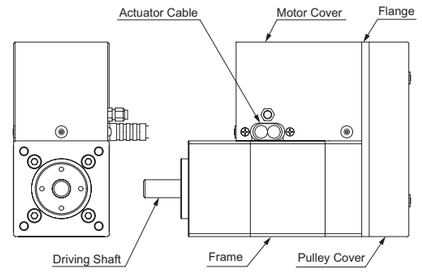
2. RCS2

2.1 Rotary Type

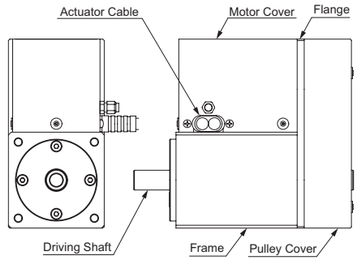
2.1.1 Motor Straight Type (RCS2-RT6)



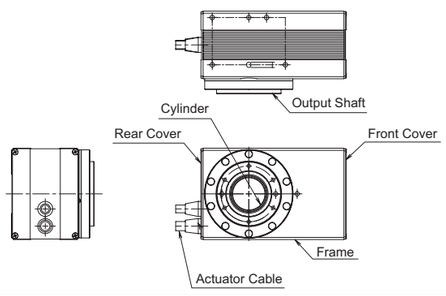
2.1.2 Motor Reversing Type (RCS2-RT6R)



2.1.3 Motor Reversing Hollowed Shaft Type (RCS2-RT7R)



2.2 Hollowed Rotary Type



Refer to the Catalog or Instruction Manual (CD) for the dimensioned drawing and the detailed appearance drawing.

Attachment

Refer to the Instruction Manual (CD) for the attachments of the actuator and loads.

[Precautions for Attachments]

No.	Item	Precautions
1	Attachment Surface	• The actuator mounting surface and other surfaces that are used as a datum should be flat enough with an accuracy of machining or equivalent treatment, and the flatness of the mounting surface needs to be ±0.05mm/m or less. • Secure the space where maintenance work can be performed.
2	Bolts to be used	• For the bolts to be used, a high-tensile bolt complying with ISO-10.9 or more is recommended. • If using the tapped holes, use screws with the thread length dimension being less than the effective depth of the holes. • In case the tapped hole is a through hole, be careful so the screw tip does not exceed the surface of the tapped hole. • For the actuator mounting, use a bolt with the dimension of its effective mating length to the tapped hole size as stated below. If tapped hole in steel → thread length same as nominal diameter If tapped hole in aluminum → thread length 2 times longer than nominal diameter
3	Tightening Torque	• Please follow the specification values stated in the Instruction Manual (CD) for the tightening torque. Failure to do so may cause an operation problem.
4	Moment of Inertia Load Moment Thrust Load	• Please follow the specified values stated in the Instruction Manual (CD) for the moment of inertia, load moment and thrust load. Failure to do so may not only cause vibration and abnormal noise, but it may also shorten the product life extraordinarily.

Wiring

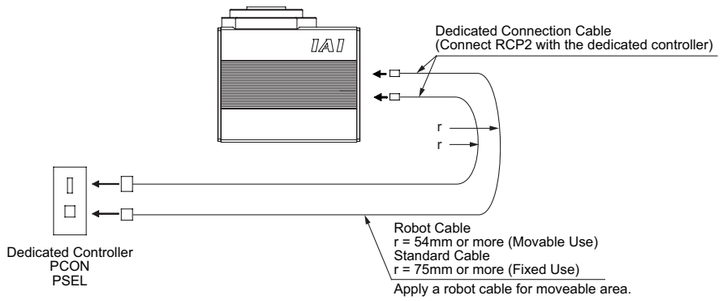
For the controller, only the dedicated controller manufactured by our company can be used.

Use the dedicated cable enclosed in the package when connecting the actuator and the controller.

1. RCP2

1.1 Small Vertical Type (RCP2-RTBS, RCP2-RTBSL)
Small Flat Type (RCP2-RTCS, RCP2-RTCSL)

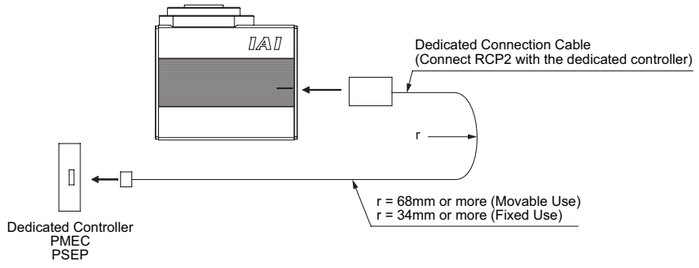
[Connection to the PCON, PSEL Controller]



Dedicated Connection Cable
- Motor Cable (Robot Cable) CB-RCP2-MA***
- Encoder Cable CB-RCP2-PB***/Encoder Cable Robot Cable CB-RCP2-PB***-RB

*** shows the cable length.
The max. length should be 20m.
Example) 080=8m

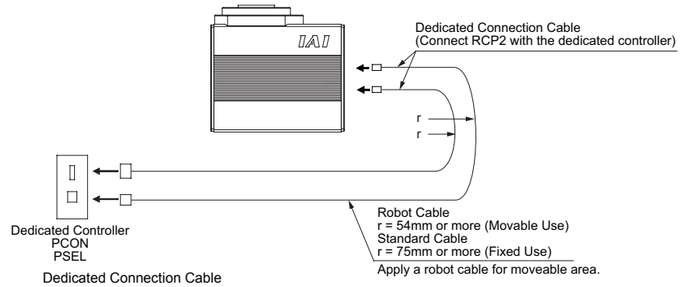
[Connection to the PMEC, PSEP Controller]



Dedicated Connection Cable CB-RPSEP-MPA***
*** shows the cable length.
The max. length should be 10m.
Example) 080=8m

1.2 Medium Vertical Type (RCP2-RTB, RCP2-RTBL)
Medium Flat Type (RCP2-RTC, RCP2-RTCL)
Large Vertical Type (RCP2-RTBB, RCP2-RTBBL)
Large Flat Type (RCP2-RTCB, RCP2-RTCBL)

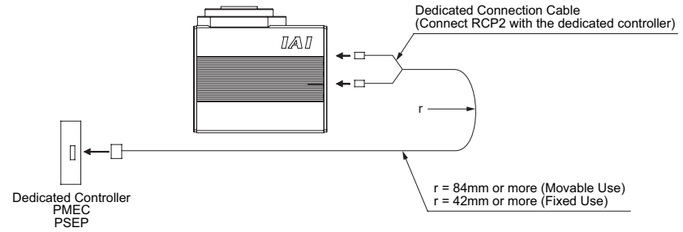
[Connection to the PCON, PSEL Controller]



Dedicated Connection Cable
- Motor Cable (Robot Cable) CB-RCP2-MA***
- Encoder Cable CB-RCP2-PB***/Encoder Cable Robot Cable CB-RCP2-PB***-RB

*** shows the cable length.
The max. length should be 20m.
Example) 080=8m

[Connection to the PMEC, PSEP Controller]



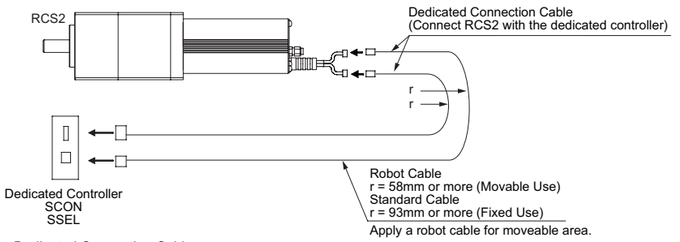
Dedicated Connection Cable
- Motor Cable (Robot Cable) CB-PSEP-MPA***

*** shows the cable length.
The max. length should be 10m.
Example) 080=8m

2. RCS2

The drawing below is that of Rotary Type as an example.

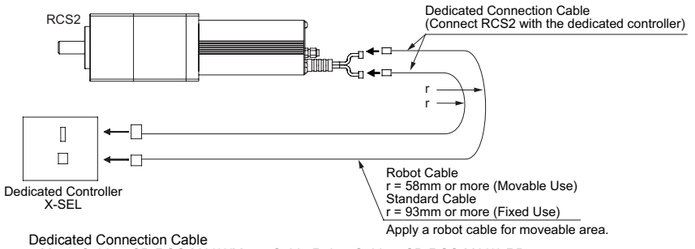
[Connection to the SCON, SSEL Controller]



Dedicated Connection Cable
- Motor Cable CB-RCC-MA***/Motor Cable Robot Cable CB-RCC-MA***-RB
- Encoder Cable CB-RCS2-PLA***/Encoder Cable Robot Cable CB-X2-PLA***

*** shows the cable length.
The max. length should be 30m.
Example) 080=8m

[Connection to the X-SEL Controller]



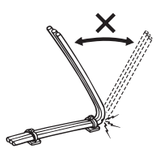
Dedicated Connection Cable
- Motor Cable CB-RCC-MA***/Motor Cable Robot Cable CB-RCC-MA***-RB
- Encoder Cable for XSEL-J/K Type CB-RCBC-PA***
/ Encoder Cable Robot Cable for XSEL-J/K Type CB-RCBC-PA***-RB
- Encoder Cable for XSEL-P/Q Type CB-RCS2-PLA***
/ Encoder Cable Robot Cable for XSEL-P/Q Type CB-X2-PLA***

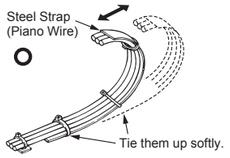
*** shows the cable length.
The max. length should be 15m. The max. length for other cables is 20m.
Example) 080=8m

(Note) Hollowed Rotary cannot be operated with a XSEL-J/K controller.

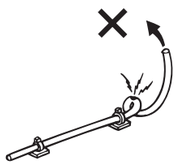
[Prohibited Items in the Cable Processing]

- Do not pull or bend forcibly the cable so as not to give any extra load or tension to the cable.
- Do not process the cable for extension or shortening by means of cutting out, combination or connecting with another cable.
- Do not let the cable flex at a single point.

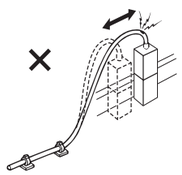




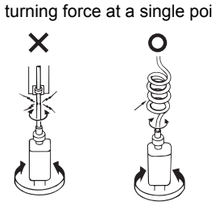
- Do not let the cable bend, kink or twist.



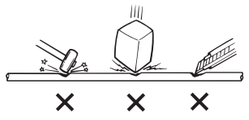
- Do not pull the cable with a strong force.



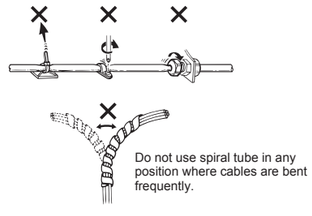
- Do not let the cable receive a turning force at a single point.



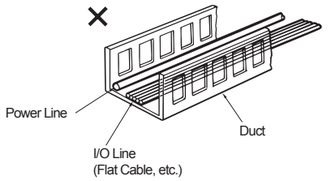
- Do not pinch, drop a heavy object onto or cut the cable.



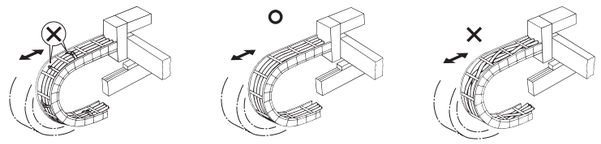
- When fixing the cable, provide a moderate slack and do not tension it too tight.



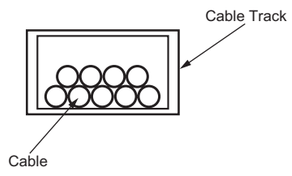
- Separate the I/O line, communication line and power line from each other. Arrange so that such lines are independently routed in the duct.



- Take care of the following items using the cable carrier.
- Arrange the wiring so that there is no entanglement or kink of the cables in the cable carrier or flexible tube, and do not bind the cables so that the cables are relatively free. (Do not bend it at an angle of 90° or less)



- The cable track capacity for cables to put in should be 60% or less to prevent cables from breaking. (Cable heat is not considered.)



⚠ Note:

- When the cable is connected or disconnected, make sure to turn off the power to the controller. When the cable is connected or disconnected with the controller power turned ON, it might cause a malfunction of the actuator and result in a serious injury or damage to the machinery.
- When the connector connection is not correct, it would be dangerous because of a malfunction of the actuator. Make sure to confirm that the connector is connected correctly.

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